

Horseshoe crabs: Moonlight dalliances, but dwindling numbers

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Even though darkness is falling and ominous clouds are gathering in the northeast, Scott Olszewski pulls on his waterproof boots and sets out down the deserted beach at Napatree Point. With all else aligning nicely, he just needs the storm to hold off and the winds to cooperate to witness a primitive spectacle — a veritable orgy on the beach.

Every spring, on the night of a full or new moon high tide, Atlantic horseshoe crabs crawl up to the water's edge to perform their own version of the beach love scene in the classic war movie "From Here to Eternity." It's a primordial ritual, one begun 450 million years ago, when fish weren't even fully evolved. And Olszewski, following his own tradition, hopes to catch them in the act.

His motives are purely scientific.

As a marine biologist with the Department of Environmental Management, Olszewski is concerned about the population of the valuable crabs, which are harvested not only for bait but also for sophisticated biomedical uses. So every spring he gets out to conduct sample counts.

"This is my 15th year doing this," he says as he trudges across the sand on the Bay side of the barrier beach.

With strong, steady winds whipping up small waves, it will not be easy finding crabs tonight. They'll probably be skittish about getting too close to shore for fear of being flipped on their backs, Olszewski says. When that happens, some can't get right side up, eventually perishing or becoming the next meal of hungry seabirds.

Seeing into the waves is difficult, and as the sun goes down Olszewski takes out a small flashlight to peer into the darkening waters. In his other hand, he carries a counter to click each time he sees a crab.

"My highest ever was 2,412 in 2012," he says.

On the lookout

What Olszewski is on the lookout for is a crab the shape and size of a dinner plate, with a long, pointy tail called a telson. Beachgoers often come upon them dead, left high and dry by the tide.

Despite their hard, protective shells, horseshoes aren't actually crustaceans like lobsters and other crabs. They're more closely related to arachnids, eight-legged creatures that include spiders.

Without much meat on them horseshoe crabs have not been marketed for human consumption. For a long time, they were harvested and ground up for fertilizer. In more recent years, their most popular use has been for bait to catch American eel and conch.

The biomedical industry also prizes the crabs. It was discovered that their blue, copper-rich blood is uniquely useful in making a clotting agent that can detect human pathogens.

Horseshoe crabs now fetch \$2 to \$4 on the market, and rising demand led fisheries regulators to step in to protect them. The Atlantic States Marine Fisheries Commission created an interstate management plan to limit their catch.

That was 1999, the same year Olszewski took over the Rhode Island horseshoe count.

Reaching a quota

When Olszewski visits Napatree on a new moon in May, it is no longer legal to take horseshoes for bait in Rhode Island. The state has already reached its quota of about 14,466 crabs.

“When it’s spawning season, there are fishermen who do nothing but eat, drink and sleep horseshoe crabs,” Olszewski says.

There is a separate quota of 34,000 crabs — which is rarely reached — for horseshoes caught for medical purposes. The number is higher because the crabs, after their blood is drawn, are returned alive to where they were caught. Most, says Olszewski, are taken to a Falmouth, Mass., biotech company, Associates of Cape Cod.

Even if the bait quota hadn’t been met, Olszewski says no one should be harvesting crabs on this night. That’s because Rhode Island prohibits taking the crabs 48 hours before and after the peak mating activity at new and full moons.

Two weeks earlier, on the full moon, Olszewski expected to find scores of horseshoes.

“It’s a perfect night,” he said then, pleased at the calm winds.

But after walking nearly half a mile down the beach, he didn’t come across one.

“Wow,” he said. “I’ve never walked this beach and not seen a crab.”

The Atlantic States commission acknowledges that “little is known” about horseshoe crab populations. Assessments suggest that their populations, greatest in the Delaware Bay, are on the rise from Florida to North Carolina and holding steady from Virginia to New Jersey.

But numbers in Rhode Island and elsewhere in New England and New York appear to be down. A stock assessment estimated the so-called biomass of horseshoes in Rhode Island at 3,300 metric tons in 1975. That dropped to 528 metric tons in 2002, rose to 735 metric tons by 2010, but fell again to 471 metric tons in 2013.

Seeing the signs

Because of the strong winds this evening, Olszewski isn’t optimistic as he briskly walks the very same route at Napatree that he has followed for years. It’s one of three sites he monitors two to four times from May to June to better understand the health of the population.

Despite the small waves on Little Narragansett Bay, Olszewski starts to see telltale signs of crabs — dark circles that look like rocks on the bottom.

“There’s a pair right there,” he says.

The male has attached itself to a larger female swimming in the shallows. She’s apparently still searching for an attractive nesting spot. Olszewski reaches into the water, picks the two up and turns them over in his hands to reveal an array of twitching legs.

“See those hooks?” he says, pointing the male’s front claws. “That’s what they use to grab hold of the females.”

After putting them back in the water, he rounds a curve that’s outside the worst of the winds. There he begins to see more crabs, including a nesting pair in the shallows.

“See how she burrows in,” he says.

The female will lay batches of eggs, a few thousand at a time, or about 90,000 eggs in all. The male then fertilizes them. Larvae hatch about two weeks later. Many will be eaten by shorebirds, for whom the eggs and larvae are a vital part of their diet.

The juvenile crabs will spend their first two years near shore before migrating into deeper waters, some as far as the Continental Shelf.

A low count

As darkness falls, Olszewski's flashlight can't penetrate the waves. Then it begins to drizzle. He has to quit early, having counted just 67 crabs. The highest counts in recent years have been in the range of 300 to 800.

"This year will go down as one of the lowest," he says. "I wouldn't say that's because there are less crabs. One year is not cause for concern."

What he is concerned about is not seeing any signs that conservation efforts are lifting the population. With the long-lived crabs becoming sexually mature when they're about 8 or 10 years old, he would have expected to see numbers rise in the nearly 15 years since the management plan began.

One possible explanation, Olszewski says, is that people with permits to catch horseshoe crabs aren't fully reporting their catch, as required, or that people without permits are taking them illegally.

"Low abundance is real. I don't think we're missing something," he says. "We would have expected a rebound at this point."

For more information about horseshoe crabs, call Olszewski at (401) 423-1934 or email him at scott.olszewski@dem.ri.gov